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the United States. The same designations are carried out through all the bars. One peculiarity will be noticed in the bars for the countries which have only recently begun to send large numbers of their natives to the United States. Of Germany, Ireland, Canada and England, the foreign white stock includes a large number of one parent born in the specified country and one in the United States. The bar for Russia and Finland, as well as those for Italy, Austria and Hungary, have a very small proportion in this class.

#### THE USE OF HELIUM FOR AIRSHIPS

AN article in *Nature* states that shortly after the commencement of the war it became evident that if helium were available in sufficient quantities to replace hydrogen in naval and military airships, the losses in life and equipment arising from the use of hydrogen would be enormously lessened. Helium, as is known, is most suitable as a filling for airship envelopes, in that it is non-inflammable and non-explosive, and, if desired, the engines may be placed within the envelope. By its use it is also possible to secure additional buoyancy by heating the gas (electrically or otherwise), and this fact might possibly lead to considerable modifications in the technique of airship maneuvers and navigation. The loss of gas from diffusion through the envelope is also less with helium than with hydrogen, but, on the other hand, the lifting power of helium is about 10 per cent. less than that of hydrogen.

Proposals had been frequently put forward by men of science regarding the development of supplies of helium for airship purposes, but the first attempt to give practical effect to these proposals was initiated by Sir Richard Threlfall, who received

support from the Admiralty through the Board of Invention and Research.

It was known that supplies of natural gas containing helium in varying amounts existed in America, and it became evident from the preliminary investigations as to cost of production, transportation, etc., that there was substantial ground for believing that helium could be obtained in large quantities at a cost which would not be prohibitive. In the course of the investigations, which were carried out with the cooperation of L'Air Liquide Co., it was found that large supplies of helium were available in Canada, which could be produced at a cost of about one shilling per cubic foot.

In the summer of 1917, when the United States of America had entered the war, and after the investigations referred to above were well under way, proposals were made to the Navy and Army and to the National Research Council of the U. S. A. to cooperate by developing the supplies of helium available in the United States. These were made, on behalf of the Admiralty, through the Board of Invention and Research by Sir Ernest Rutherford and a special Commission consisting of Commander Bridge, R.N., Lieutenant-Colonel Lowcock, and Professor John Satterly.

The authorities cited agreed to cooperate with vigor in supporting these proposals, and large orders were at once placed by them with the Air Reduction Co. and the Lynde Co. for plant, equipment, cylinders, etc. The Bureau of Mines also cooperated in developing a new type of rectifying and purifying machine. By July, 1918, the production of helium in moderate quantities was accomplished, and from that time onward the possibility of securing large supplies of helium was assured.

Concurrently, all practical details of the production of helium-borne airships and of the navigation of this type of craft were developed by the airship production section of the Navy. At the same time, under the direction of Professor McLennan, plans were prepared and steps taken to erect and equip a station for purifying the helium which might become contaminated in service. Experimental investigations were also initiated with the object of developing the possible technical and scientific uses of helium. In particular, balance and spectroscopic methods for testing the purity of the gas were worked out, studies on the relative permeability of balloon fabrics to hydrogen and helium were commenced, and experiments were begun to exploit the use of helium in gas-filled incandescent lamps, gas-filled arc lamps, and thermionic valves. The equipment provided for the purification of contaminated helium in large quantities supplied the major portion of the apparatus required to liquefy helium, and arrangements were therefore made to produce this gas in a liquid form.

The advances already made by the time the armistice commenced warrants the opinion that at the end of another year large supplies of helium would have been produced within the empire at a low cost, helium-filled aircraft would have been in service, and great progress would have been made in exploiting the technical and scientific uses of this gas.

#### SCIENTIFIC ITEMS

WE record with regret the death of Charles Leander Doolittle, Flower professor of astronomy, emeritus; at the University of Pennsylvania and director of the Flower Observatory; of John Wallace Baird, professor of experimental psychology in Clark University; of Captain Theodore de Booy, the archeologist and explorer; of G. Carey Foster, formerly principal of University College, London, and previously professor of physics there, and of R. A. E. Blanchard, professor of parasitology in the faculty of medicine, University of Paris.

DR. WILLIAM WILLIAMS KEEN, the distinguished surgeon, had conferred on him the honorary degree of Doctor of Laws by the University of Pennsylvania on University Day. Dr. Keen is the only commissioned officer in the present war who was a commissioned officer during the Civil War.—Dr. Livingston Farrand has resigned the presidency of the University of Colorado to become the executive head of the American Red Cross. Dr. Farrand was formerly professor of anthropology at Columbia University.

THE work on volcanology at Kilauea has been placed under the U. S. Weather Bureau. The transfer was effective on February 15 and the appointment of the Director Professor T. A. Jaggar has been approved. An appropriation of \$10,000 for the year is made by the government for continuing the work heretofore maintained by the Volcano Research Association.